

News Release

October 29, 2010

USGS Science at GSA

In this U.S. Geological Survey media tipsheet, we've gone through hundreds of GSA conference abstracts and selected some of the newest, most exciting USGS science presentations for your convenience. We hope you find it useful.

News media representatives are invited to visit the USGS booth in the GSA Exhibit Hall. Our exhibit highlights climate and land-use change, energy, minerals, and environmental health, water, natural hazards, and more. This is an easy place to connect with scientists and public affairs specialists and grab some USGS publications and information.



Older debris-flow sediment deposits in lower Emerson Gulch, burned by the Fourmile Canyon wildfire; view is upstream. Photo by John G. Elliott, USGS, Sept. 23, 2010.

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Sunday, 10/31, 10:05 a.m., Room 108

Contribution of PAHs from Coal-Tar Pavement Seal-coat to 40 U.S. Lakes Evaluated Using Mass-Balance Receptor Modeling

Peter VanMetre

Coal-tar-based pavement sealant is the largest source of polycyclic aromatic hydrocarbons (PAHs) found in 40 urban lakes studied by the USGS. PAHs are an environmental health concern because several are probable human carcinogens, they are toxic to fish and other aquatic life, and their concentrations have been increasing in urban lakes in recent decades. Coal-tar-based pavement sealant is the black, shiny substance sprayed or painted on many parking lots, driveways, and playgrounds. USGS scientists evaluated the contribution of PAHs from many different sources to lakes in cities from Anchorage, Alaska, to Orlando, Fla.

Tuesday, 11/2, 11:05 a.m., Room 110/112

Estimating Potential Post-Wildfire Debris-Flow Characteristics in Mountainous Areas of Colorado, USA

John Elliott

Debris-flow probabilities following the September Four-mile Creek wildfire were estimated by USGS scientists using models derived from recently burned basins throughout the intermountain western United States. Model results indicated a potential for substantial debris-flow damage to buildings, roads, bridges, culverts, streams, and reservoirs located both within and immediately downstream from the burned area of Boulder County, Colo. These debris-flow scenarios are useful for conceptualizing potential post-wildfire hazards and for developing mitigation strategies.

Monday, 11/1, 4:35 p.m., Room 102

Mineral Analysis and Geochemical Characterization of Exogenic and Endogenic Particles in Thoracic Tissue

Greg Meeker

A New York City firefighter was diagnosed with a chronic, progressive form of lung disease five years after being exposed to World Trade Center dust on the morning of September 11, 2001. USGS scientists used scanning electron microscopy and x-ray microanalysis to image and analyze particles from the firefighter's lung tissue. Results are part of a larger study in collaboration with the Columbia University College of Physicians and Surgeons and New York City Fire Department to identify particulate matter and other anomalies in lung tissue that might be attributable to exposures at the WTC site. The presentation will use data from the WTC study to discuss the stability of minerals in the body.

Monday, 11/1, 8:20 a.m., Room 111/113

Evidence of Late Holocene Surface Rupturing on the Enriquillo-Plantain Garden Fault Zone and the Earthquake Hazard in Haiti

Anthony Crone

According to the combined analysis and modeling of various geoscience datasets, the earthquake hazard to Port-au-Prince, Haiti remains high despite the devastating magnitude 7.0 quake of January 2010 that caused at least 230,000 fatalities. Port-au-Prince is within a few miles of the Enriquillo-Plantain Garden fault zone, a major plate-boundary fault much like the San Andreas fault. A future quake on this fault could be located closer to the capital city of Port-au-Prince and have a magnitude larger than the January 12 quake. The 2010 quake did not actually occur on the main fault zone; therefore it did not relieve much, if any, of the accumulated strain on the fault.

Tuesday, 11/2, 8:05 a.m., Room 110/112

A Low-Cost Method to Measure the Timing of Post-Fire Debris Flows and Flash Floods

Robert Leeper

Data on the specific timing of post-fire debris flows and flash floods is very limited. This lack of information has made it difficult to quantify precisely the hydrologic triggering conditions of these destructive events. USGS scientists have developed an approach for recording the timing of debris flows and floods using relatively inexpensive pressure transducers, which are typically used to monitor groundwater levels and streamflow.



Monday, 11/1, 1:45 p.m., Room 708

Spatial and Stratiographic Distribution of Water in Oil Shale of the Green River Formation Using Fischer Assay, Piceance Basin, Northwestern Colorado

Ronald Johnson

Water within Piceance Basin, Colorado oil shale can provide only a fraction of the water needed for an oil shale industry. The distribution of water in oil shale of the Eocene Green River Formation in the Piceance Basin of northwestern Colorado was studied in part to see if water produced during the retorting of oil shale could provide a significant amount of the water needed for an oil shale industry. Recent estimates of water requirements vary from one to 10 barrels of water per barrel of oil produced, depending on the type of retort process used; However, the ratio of water to oil generated with retorting is significantly less than one for most areas of the basin.

Tuesday, 11/2, 11:20 a.m., Room 110/112

Debris-Flow Hazards in El Salvador—A Difficult Problem and Significant Opportunity

Jon Major

Volcanic debris flows in El Salvador occur frequently and pose significant risk to thousands of people. The Salvadoran government faces a significant challenge to provide effective warnings and mitigate hazardous events. USGS scientists assisted Salvadoran scientists with refinement of methods for predicting debris-flow location and timing to help the governmental geological agency enhance its operational capacity to mitigate future disasters.

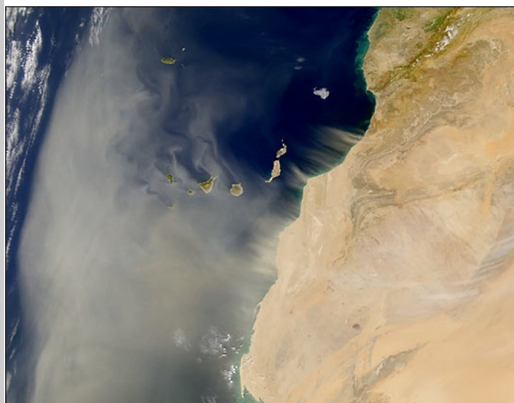
Monday, 11/1, 11:10 a.m., Room 709/711

African Dust Transport in the Quaternary to the Western Atlantic Ocean and the Origin of Bermuda's Soils and Paleosoils

Daniel Muhs

African dust has been transported to the western Atlantic Ocean over much of the past several hundred thousand years and may have formed part of the soils of the East Coast of the U.S., according to a discovery by USGS scientists and collaborators. Dust from Africa can travel long distances and is frequently transported to the western Atlantic Ocean during the summer. Soils on the island of Bermuda are derived partly from the volcanic pedestal that the island is built on, but a more important source is African dust, revealed by geochemical fingerprinting techniques. If dust from Africa reaches Bermuda, it is likely that soils on the East Coast of the U.S. are also formed partly from this distant source.

Satellite image: Dust from Africa, 11 Feb 2001; courtesy of SeaWiFS Project, NASA/Goddard Space Flight Center and ORBIMAGE



Monday, 11/1, 4:05 p.m., Room 102

Mineralogical and Geochemical Influences on the 2010 Nigerian Lead Poisoning Outbreak Linked to Artisanal Gold Ore Processing

Geoff Plumlee

Lead poisoning was determined to cause a pattern of ongoing childhood deaths (160+) and illness (355+ cases) in several villages of Zamfara State, Nigeria in spring 2010. The presumed cause was artisanal gold ore processing. The Center for Disease Control deployed a rapid response team to help the Nigerian government assess the extent of the lead poisoning, characterize the routes and sources of exposure, and recommend measures to mitigate exposures. The team collected an extensive sample suite from several affected villages, including raw and ground ores, soils, waters, and sweep dust samples. The USGS is currently collaborating with CDC to determine mineralogical and geochemical characteristics of the solid samples, to aid in exposure assessment. It is recommended that interested journalists attend the preceding talk at 3:45p.m. from CDC colleagues on the medical and health aspects of this problem.



Sunday, 10/31, 4 p.m., Room 104/106

The Relation Between Dissolved Oxygen and Other Chemical Properties in Barton Springs, Central Texas

Barbara Mahler

The endangered Barton Springs salamander and other aquatic species in Barton Springs, Austin, Texas might be under increased stress if spring flow decreases or water temperature increases. The amount of dissolved oxygen in Barton Springs flow varies widely, and during a recent drought dropped to levels that inhibit salamander development and growth. This salamander relies on the dissolved oxygen in water flowing from the springs to breathe, and water temperature and the rate of spring flow control the amount of dissolved oxygen in the water.

Monday, 11/1, 9-11 a.m. and 4:30-5:30 p.m.,
Hall B, Poster Booth 186

Trends in Streamflow, Temperature, and Precipitation on Tribal Lands in the Northern Great Plains

Parker Norton

Tribal members of the Northern Great Plains, with their intimate connection to the land, are substantially influenced by change to their environment. The USGS examines climate change on tribal lands as expressed in historical temperature, precipitation, and streamflow records for selected rivers starting in 1957 on the Standing Rock Sioux Reservation and Cheyenne River Sioux Reservations in the Great Plains of North and South Dakota.

Wednesday, 11/3, 9:25 a.m., Room 709/711

Recognition of a Regional Ordovician Valmy Formation Thrust Sheet: Implications for Assembly of the Roberts Mountains Allochthon and Exploration for Concealed Carlin-Type Gold Deposits

Christopher Holm-Denoma

A newly recognized regional fault in the central Great Basin provides clues to past tectonic events in the region and helps to identify areas where concealed gold deposits may be in reach of drilling. Detailed field investigations coupled with new fossil identification and remote sensing have helped reveal this fault.



Monday, 11/1, 9:30-11 a.m., 4:30-5:30 p.m.,
Poster Hall B

Rejuvenating Pre-GPS Era Geophysical Surveys Using the National Map

Tom Shoberg

The National Map from the USGS can provide a new format for data from old, pre-GPS geophysical surveys. These old surveys stand as valuable, largely untapped sources of scientific data and could be used much more widely if in a format that had reasonable accuracy, availability and ease-of-use, such as The National Map.

Tuesday, 11/2, 9:30 a.m., Room 705/707

The History and Growth of a Recent Dune Field at Grand Falls, Navajo Nation, NE Arizona

Margaret Hiza Redsteer

Current work to document the genesis, growth, and migration of dunes in northeastern Arizona consists of an array of techniques that USGS scientists are applying primarily at a dune field near Grand Falls, north of the Little Colorado River—a field that continues to grow at rates as high as 34 meters per year as dunes migrate downwind. Study techniques include historic georeferenced aerial photos, high precision GPS measurements, ground based LIDAR, meteorological monitoring, Landsat Imagery, field sampling, and the history of drought and flood events in the adjacent Little Colorado River.



Tuesday, 11/2, 10 a.m., Room 110/112

Field Methods for Predicting Soil Mobility

Jonathan McKenna

Certain landslide-prone soils are susceptible to transforming into rapidly moving liquefied flows, and a new field method can help to identify soils susceptible to flowing. Required field measurements include intrinsic hydraulic permeability, soil density, and grain size distribution.

Monday, 11/1, 2:20 p.m., Room 207

Development of Assessment Methods in Support of USGS Integrated Science - Wyoming Landscape Conservation Initiative

Robert McDougal

The Wyoming Landscape Conservation Initiative (WLCI) is a long-term science based effort to assess and enhance aquatic and terrestrial habitats at a landscape scale in southwestern Wyoming, while facilitating responsible development through local collaboration and partnerships. Wyoming encompasses some of the highest quality wildlife habitats in the Intermountain West. At the same time, this region is an active source of renewable and non-renewable energy. The WLCI exchanges information, data, and research findings among partners, industry, and stakeholders to improve habitat conditions and long-term viability of species at a landscape scale while complementing existing habitat reclamation and mitigation efforts.

Tuesday, 11/2, 11:30 a.m., Room 708

USGS Library Training and Outreach: Finding and Using Scientific Literature and Data

Emily Wild

Scientists utilize interdisciplinary information sources from varied science and geographic areas. The USGS Library provides access and training for these sources that are continually developed. These internal training sessions and external outreach activities are presented by USGS librarians to enhance dissemination of information to the USGS scientists, the geoscience community, and other librarians within the Rocky Mountains.

Sunday, 10/31, 5 p.m., Room 709/711

The Continuing Story of the Angus Mammoth Controversy: IRSI Dating to the Rescue

Shannon Mahan

The long controversy about the age of a Nebraska archaeological site containing the remains of a mammoth has been resolved. Research over the last 35 years, including archival research, oral interviews, test excavations, geomorphic studies, and dating of alluvium at the site has finally ended the controversy over the age of the site. In 1931, then director of the Colorado Museum of Natural History, Jesse Figgins, interpreted the Angus Mammoth, discovered in south-central Nebraska, to be the first, well-documented association of a fluted artifact with a mammoth in North America. However, the site soon became enmeshed in an 80-year controversy based on a geological interpretation that the deposits were much too old for a mammoth-human association.



Monday, 11/1, 2:15 p.m., Room 708

Leaching of Hazardous Substances from Retorted Oil Shale During High Temperature Water Flushing

Justin Birdwell

Leaching of hazardous materials is one of the methods shale oil producers plan to use to restore environmental quality following shale oil production. Most of the vast amounts of oil shale in the American West with the potential to produce shale oil is buried too deep to mine and process at the surface, so several companies are developing methods to cook the oil out of the rock while it's still in the ground. This will leave some hazardous substances behind that will have to be removed, which can be done partially through the leaching process discussed.

Photo: Oil shale outcrop in northwest Colorado



Monday, 11/1, 8 a.m., Room 205

Geochemistry of Geologic Sequestration of CO₂—Sources of Major Uncertainties

Yousif Kharaka

Successful sequestration of large volumes of human-caused CO₂ requires an in depth understanding and accurate predictions of CO₂-brine-oil-mineral interactions from pore space to basin scales. These geochemical and biogeochemical interactions would determine the long-term storage security, reservoir performance and environmental impacts. In this introduction, recent results and insights obtained from many laboratory and pilot field experiments, natural analogues, EOR and commercial CO₂ sequestration operations are discussed.

Sunday, 10/31, 9-11 a.m. and 4:30-5:30 p.m., Booth 256

The Volcanoes Exploration Project: Pu'u 'O'o —A Web Site and Workshop for Utilizing Near-Real Time Volcano Monitoring Data in Geoscience Education

Mike Poland

The Volcanoes Exploration Project: Pu'u 'O'o (VEPP) website is a geoscience education resource that demonstrates the dynamic nature of volcanoes, promotes excitement about the process of scientific discovery through hands-on learning, and inspires the next generation of Earth scientists. The VEPP site provides access, in near-real time, to geodetic and seismic data from the Kilauea Volcano in Hawai'i, via a time series query tool, and webcam images from Pu'u 'O'o crater are archived and available for viewing as a means of examining visual changes in volcanic activity over time. Based out of the USGS Hawaiian Volcano Observatory, it is a collaborative effort among the USGS, NASA, and the University of Hawai'i, Manoa.

<http://www.nagt.org/nagt/vepp/index.html>



Sunday, 10/31, 4:50 p.m., Room 103/105

Fault Veins and their Influence on Mountain Watershed Hydrogeology, the Standard Mine of Elk Basin, Colorado

Jonathan Caine

Geological data are critical in the development of accurate conceptual and predictive computer models used to aid remediation of hazardous abandoned mine sites. Numerous abandoned mines in the western United States are associated with contamination of water resources, and some are Superfund sites. Detailed mapping of rock units, geologic structures, and hydrothermal alteration mineralogy integrated with ground and borehole geophysics, petrophysics, and aquifer testing provide basic data on differing geologic structures that can control the release and transport of metal-containing contaminants.

Tuesday, 11/2, 1:40 p.m., Room 110/112

Post-fire debris-flow monitoring in southern California: Observations from in-situ measurements of 28 debris flow events

Jason Kean

Post-fire debris flows occur within minutes of intense rainfall in mountainous areas, according to new USGS data. This information is useful for warning system guidance and for testing predictive models of post-fire debris flow, which is a common hazard after wildfire. Direct measurements of post-fire debris flows in five southern California watersheds burned in 2009 were assessed.

